

Claims

What is claimed is:

1. A method for characterizing performance of a data handling system having a
5 cache, comprising steps of:
 - a) sending commands to the data handling system for a set of data blocks that are
large relative to a size of the cache dedicated for the commands;
 - b) recording a block service time for each large data block;
 - c) comparing the block service time to a first threshold;
 - d) scoring the data handling system based on the comparison of the block service
10 time to the first threshold.
2. The method of claim 1, wherein the data handling system includes a disc drive.
3. The method of claim 2, wherein the commands from the sending step a) are
15 configured to cause the disc drive to parse the command, seek to an appropriate track on a disc of
the disc drive, wait for an appropriate location on the disc, track-follow on the appropriate track,
and pass data between a buffer of the disc drive and the disc and between the buffer and a host
computer interfaced with the disc drive.
4. The method of claim 1, wherein the data handling system includes a computer
20 network and the commands from the sending step a) are configured to cause one or more
networked computers to parse the command, transmit a request for re-transmission over the
network, and receive retried data transmitted over the network.
5. The method of claim 1, wherein the data blocks are randomly positioned.
6. The method of claim 1, wherein the scoring step d) comprises:
25 d)(i) heavily and negatively weighting the block service times exceeding the first
30 threshold;

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d)(ii) lightly and positively weighting the block service times not exceeding the first threshold; and

d)(iii) averaging the weighted block service times.

7. The method of claim 1, further comprising steps of:

e) recording the size of data quality errors produced in response to the commands;

f) recording the frequency of data quality errors produced in response to the commands; and

g) accounting for the size and frequency of data quality errors in scoring step d).

8. The method of claim 1, further comprising steps of:

h) estimating the minimum and maximum sustained data rates from the recorded block service times.

9. The method of claim 1, wherein the data handling system includes a disc drive, the method further comprising steps of:

i) estimating the locations of data on a disc of the disc drive from the recorded block service times and corresponding commands; and

j) determining a fraction of the drive that allows block service times to not exceed the first threshold from the estimated locations and corresponding block service times.

10. The method of claim 1, further comprising steps of:

k) computing a second threshold for a mode that varies from a mode corresponding to the first threshold;

l) comparing the block service time to the second threshold; and

m) scoring the data handling system for the second mode based on the comparison of the block service time to the second threshold.

11. The method of claim 1, further comprising steps of:

n) computing a third threshold for an alternate block size that varies from a size of the data blocks of sending step a);

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- o) comparing the block service time to the third threshold; and
- p) scoring the data handling system for the alternate block size based on the comparison of the block service time to the third threshold.

5 12. The method of claim 1, wherein the sending step a) further comprises sending commands that prioritize throughput over data quality.

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13. A system for characterizing performance of a data handling system having a cache, comprising:

a host computer for providing commands that are serviced by the data handling system, the host computer configured to send commands to the data handling system for a set of data blocks that are large relative to a size of the cache dedicated for the commands, record a block service time for each large data block, compare the block service time to a first threshold, and score the data handling system based on the comparison of the block service time to the first threshold; and

an interface for communicating the commands from the host computer to the data handling system.

14. The performance characterization system of claim 13, wherein the data handling system includes a disc drive and the commands from the system for characterizing performance are configured to cause the disc drive to parse the command, seek to an appropriate track on a disc of the disc drive, wait for an appropriate location on the disc, track-follow on the appropriate track, and pass data between a buffer of the disc drive and the disc and between the buffer and a host computer interfaced with the disc drive.

15. The performance characterization system of claim 13, wherein the data handling system includes a computer network and the commands from the system for characterizing performance are configured to cause one or more networked computers to parse the command, transmit a request for re-transmission over the network, and receive retried data transmitted over the network.

16. The performance characterization system of claim 13, wherein the data blocks are randomly positioned.

17. The performance characterization system of claim 13, wherein the host computer is further configured to record the size of data quality errors produced in response to the commands, record the frequency of data quality errors produced in response to the commands,

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and account for the size and frequency of data quality errors when scoring the data handling system.

18. The performance characterization system of claim 13, wherein the host computer
5 is further configured to compute a second threshold for a mode that varies from a mode
corresponding to the first threshold, compare the block service time to the second threshold, and
score the data handling system for the second mode based on the comparison of the block service
time to the second threshold.

10 19. The performance characterization system of claim 13, wherein the host computer
is further configured to estimate a minimum and maximum sustained data rate from the recorded
block service times, compute a third threshold for an alternate block size that varies from a size
of the data blocks corresponding to the commands, adjust each recorded block service time such
that different amounts of time are subtracted from each block service time to account for the
15 alternative block size based on the estimate of the minimum and maximum sustained data rates,
compare the adjusted block service times to the third threshold, and score the data handling
system for the alternate block size based on the comparison of the adjusted block service times to
the third threshold.

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